

## Claims

1. An integral polyurethane foam obtainable by reacting
  - a) a polyisocyanate prepolymer with
  - 5 b) a polyether polyol mixture comprising the constituents
    - b1) a polyether polyol prepared by alkoxylation of a bifunctional starter molecule by means of ethylene oxide and propylene oxide, with the ethylene oxide content being more than 50% by weight, based on 100 percent by weight of alkylene oxides and starter molecule, and at least 5% of the ethylene oxide being present as an EO end cap, and
    - 10 b2) a polyether polyol prepared by alkoxylation of a trifunctional or tetrafunctional starter molecule by means of ethylene oxide and propylene oxide, with the ethylene oxide content being more than 50% by weight, based on 100 percent by weight of alkylene oxides and starter molecule, and at least 5% of the ethylene oxide being present as an EO end cap, and
    - 15 c) chain extenders.
2. The integral polyurethane foam according to claim 1, wherein the constituents are used in the following amounts:
  - (b1) in an amount of from 15 to 80% by weight,
  - (b2) in an amount of from 1 to 30% by weight and
  - (c) in an amount of from 5 to 20% by weight, based on the total weight of the components (b) and (c).
- 25 3. The integral polyurethane foam according to claim 1 or 2, wherein the constituents (b1) and (b2) have an ethylene oxide content of from 60 to 85% by weight.
4. The integral polyurethane foam according to any of claims 1 to 3 which is an integral flexible foam based on polyurethanes and having a Shore hardness in the range 20-90 A, a tensile strength of up to 20 N/mm<sup>2</sup>, an elongation of up to 800% and a tear propagation resistance up to 45 N/mm.
- 30 5. The integral polyurethane foam according to any of claims 1 to 4, wherein the integral polyurethane foam comprises sheet silicates.
- 35 6. The integral polyurethane foam according to claim 5, wherein the sheet silicates are exfoliated.
- 40 7. A process for producing integral polyurethane foams by reacting
  - a) a polyisocyanate prepolymer with
  - b) a polyol mixture comprising the constituents

- 5           b1) a polyether polyol prepared by alkoxylation of a bifunctional starter molecule by means of ethylene oxide and propylene oxide, with the ethylene oxide content being more than 50% by weight, based on 100 percent by weight of alkylene oxides and starter molecule, and at least 5% of the ethylene oxide being present as an EO end cap, and
- 10           b2) a polyether polyol prepared by alkoxylation of a trifunctional or tetrafunctional starter molecule by means of ethylene oxide and propylene oxide, with the ethylene oxide content being more than 50% by weight, based on 100 percent by weight of alkylene oxides and starter molecule, and at least 5% of the ethylene oxide being present as an EO end cap, and
- 15           c) chain extenders.

8. An outer shoe sole having a density of from 800 to 1200 g/l and comprising an integral polyurethane foam according to any of claims 1 to 6.

9. A middle shoe sole having a density of from 250 to 600 g/l and comprising an integral polyurethane foam according to any of claims 1 to 6.

10. The use of an outer shoe sole according to claim 8 or a middle shoe sole according to claim 9 for producing swelling-resistant shoe soles which display swelling of less than 12% in accordance with EN 344-1 clause 4.8.9.

20           11. The use of an outer shoe sole according to claim 8 or a middle shoe sole according to claim 9 for producing swelling-resistant and hydrolysis-stable shoe soles which conform to the standard EN 344-1 clauses 4.8.9. and 4.8.6.

25